

2019-2020: Millard Oakley STEM Center

Definition of Unit

Providing Department:

Millard Oakley STEM Center

Department/Unit Contact:

Darek Potter

Mission/Vision Statement:

Vision

The Oakley STEM Center is a national leader in rural STEM Education.

Mission

The Oakley STEM Center enriches pre-kindergarten through college (P-16) student STEM learning with hands-on inquiry, enhances the STEM preparation of new and practicing prekindergarten through high school (P-12) teachers, models innovative instructional design and learning environments, conducts rigorous STEM education research, and collaborates with industry and organizations to strengthen STEM education initiatives across the region, state, and nation.

Oakley STEM Center Goal 1: Administration

Define Goal:

Oakley STEM Center Goal 1:

Center Administration: Establish, maintain, and improve STEM Center operational procedures, processes, and facility management.

Intended Outcomes / Objectives:

Goal 1 Objectives:

1.1 Lending Library

1.1.a Maintain a dynamic inventory of all Lending Library items.

Strategic Alignment: Strategic Goal 2: Tennessee Tech innovation in all we do, embracing and deploying our technological foundation in our education, research, service, and stewardship. Priority Action 2C: Implement specific strategies, structures, and resources to serve adult learners and offer online/hybrid delivery systems to increase accessibility, expand our reach, and enhance our impact and reputation. Strategic Goal 3: Tennessee Tech is committed to optimizing resources and continuously improving effectiveness, efficiency, and return on investment for students. Priority Action 3A: Improve efficiency and effectiveness of operational/ administrative processes and procedures. Strategic Goal 4: Tennessee Tech fosters partnerships with government, business, and non-profit organizations to advance economic and workforce development, create and disseminate knowledge, serve the public good, and generate cultural impact. Priority Action 4A: Develop new strategically driven sustainable partnerships.

Grand Challenge Anticipated Outcomes: Outcome 6: Integrate important new technology into Grand Challenge activities and appropriate classes. Outcome 7: Provide a focus for innovation and creative ideas by campus implementation of the Grand Challenge. Outcome 9: Attract new and encourage current stakeholders to engage in interdisciplinary opportunities that align with our mission and goals to achieve various aspects of the Grand Challenge. Outcome 10: Increase Tennessee Tech's relevance and establish our leadership and relevance to the community and every beneficiary by providing additional learning opportunities to the Upper Cumberland region, such as job shadowing with local Tech alumni and by establishing a presence in our Upper Cumberland school systems. Outcome 11: Raise Tennessee Tech's public profile and dramatically improve public sentiment, garnering press coverage, and other visible accolades.

Assessment Tool: No specific assessment tool required. Objective met upon maintaining an up-to-date inventory of all items in the Lending Library and upon completion of Lending Library inventory, which shall be completed in November of every even year.

Status: Successful. Inventory is up to date and new items have been added to the lending library website. The next full inventory will occur November 2020.

1.1.b Identify Lending Library items that are never or rarely requested (< one time per every three years) and donate those items to P-16 educators.

Strategic Alignment: Strategic Goal 2: Tennessee Tech innovation in all we do, embracing and deploying our technological foundation in our education, research, service, and stewardship. Priority Action 2C: Implement specific strategies, structures, and resources to serve adult learners and offer online/hybrid delivery systems to increase accessibility, expand our reach, and enhance our impact and reputation. Strategic Goal 3: Tennessee Tech is committed to optimizing resources and continuously improving effectiveness, efficiency, and return on investment for students. Priority Action 3A: Improve efficiency and effectiveness of operational/ administrative processes and procedures. Strategic Goal 4: Tennessee Tech fosters partnerships with government, business, and non-profit organizations to advance economic and workforce development, create and disseminate knowledge, serve the public good, and generate cultural impact. Priority Action 4A: Develop new strategically driven sustainable partnerships.

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Assessment Tool: No specific assessment tool required. Objective met upon identifying Lending Library items that have been leased less than one time over the prior three fiscal years.

Status: In-Progress. During the 2018-2019 fiscal year the STEM Center acquired a new Lending Library software management tool (MyTurn). The new software includes tools to track both viewed and leased items. Due to COVID-19, Lending Library usage slowed during the second half of the 2019-2020 fiscal year. Subsequently, a decision was made by STEM Center staff to collect an additional year of data prior to evaluating which items should be removed from the Lending Library and donated to P-16. This objective will carry forward into the 2020-2021 fiscal year.

1.2 Virtual Theater & Mixed Reality Tent

1.2.a Acquire at least two additional affordable videos for the Virtual Theater.

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Assessment Tool: No specific assessment tool required. Objective met upon execution of contract for at least two additional videos that do not exceed a cost of \$1.00 per head per viewing.

Status: Successful. Two new titles were obtained in December 2019 for a cost for \$1.00 per head per viewing.

- 1) Watermelon Magic: Chronicles a season on the family farm, as Sylvie grows a patch of watermelons to sell at market. With time, patience, and tender loving care, Sylvie nurtures the seeds from tender sprouts to sprawling vines and flowers that become the fruit that she harvests. But when it's time to say goodbye to her watermelon babies, can she part with them? Journey with Sylvie as she learns how to care for plants in various stages, discovers the magic of growing healthy food in her garden, and realizes the greatest joy of all-sharing.

- 2) Touch the Stars: Showcases the robotic spacecraft used in exploration of our solar system and the galaxy beyond. The film traces the path to space through the history of NASA's probes, orbiters, and landers - from the heart of our solar system and the surface of its planets and moons to the grand tour of the Voyager spacecraft through the outer planets and beyond. Created with the latest high definition imagery and scientific data, Touch the Stars engages audiences through the use of real footage and 3-dimensional vistas, transporting them to planets and distant stars alongside these heroic robot explorers.

1.2.b Finalize construction of recording space in the Mixed Reality Cave.

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Grand Challenge Anticipated Outcomes: Outcome 1: Engage the entire campus community with a topic that can be grasped and envisioned by everyone on campus, with their own ideas for solutions incorporated into the endeavor. Outcome 5: Support diversity by bringing multicultural and inclusive activities to local communities. Outcome 6: Integrate important new technology into Grand Challenge activities and appropriate classes. Outcome 7: Provide a focus for innovation and creative ideas by campus implementation of the Grand Challenge. Outcome 9: Attract new and encourage current stakeholders to engage in interdisciplinary opportunities. Outcome 10: Increase Tennessee Tech's relevance and establish our leadership and relevance to the community

and every beneficiary by providing additional learning opportunities to the Upper Cumberland region, such as job shadowing with local Tech alumni and by establishing a presence in our Upper Cumberland school systems. Outcome 11: Raise Tennessee Tech's public profile and dramatically improve public sentiment, garnering press coverage, and other visible accolades.

Assessment Tool: No specific assessment tool required. Objective met upon installation/construction of the recording space within the Mixed Reality Cave and its utilization by a STEM Center stakeholder.

Status: Successful. The installation/construction of the recording space in the Mixed Reality Cave was completed during the 2019-2020 fiscal year. Since its completion, the recording space has been successfully utilized multiple times for book readings as part of the Center's STEM AT HOME program.

1.3 Facility Scheduling

1.3.a Expeditions: Maintain a dynamic process for communicating with P-12 teachers who have requested expeditions for their P-12 students. The process must project both excitement and customer service, be transparent and understandable to STEM Center outreach staff, and include some form of a digital survey to make scheduling efficient for both the P-12 teacher(s) and STEM Center staff.

Strategic Alignment: Strategic Goal 2: Tennessee Tech innovation in all we do, embracing and deploying our technological foundation in our education, research, service, and stewardship. Priority Action 2B: Increase research, scholarly activities, and intellectual and creative contributions aligned with university, college, and departmental strategic priorities. Strategic Goal 3: Tennessee Tech is committed to optimizing resources and continuously improving effectiveness, efficiency, and return on investment for students. Priority Action 3A: Improve efficiency and effectiveness of operational/administrative processes and procedures. Strategic Goal 4: Tennessee Tech fosters partnerships with government, business, and non-profit organizations to advance economic and workforce development, create and disseminate knowledge, serve the public good, and generate cultural impact. Priority Action 4A: Develop new strategically driven sustainable partnerships. Priority Action 4D: Increase alumni and friend engagement and impact.

Grand Challenge Anticipated Outcomes: Outcome 2: Increase student engagement by offering them the opportunity to address real issues and inspiring them and their faculty mentors to solve regional problems to improve quality of life. Outcome 3: Increase student career readiness by opening up new career and learning opportunities, establishing new connections and expanding professional networks. Outcome 5: Support diversity by bringing multicultural and inclusive activities to local communities. Outcome 6: Integrate important new technology into Grand Challenge activities and appropriate classes. Outcome 7: Provide a focus for innovation and creative ideas by campus implementation of the Grand Challenge. Outcome 9: Attract new and encourage current stakeholders to engage in interdisciplinary opportunities that align with our mission and goals to achieve various aspects of the Grand Challenge. Outcome 10: Increase Tennessee Tech's relevance and establish our leadership and relevance to the

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Assessment Tool: No specific assessment tool required. Objective met upon the completion of at least one annual formal meeting to review all aspects of the existing process and improve upon it (if needed).

Status: Successful. The existing process includes: 1) responding to initial inquiries about an expedition trip, which includes a digital application with questions such as number of students, special needs requirements, preferred dates/time, etc., 2) offering a recommended date as well as rules/requirements for the expedition, 3) reminding P-12 of the expedition one week before their arrival, and 4) following up with an email about the expedition experience that includes a survey to evaluate their experience. The established process projects both excitement and customer service, is transparent, and is understandable to STEM Center outreach staff. On February 27, 2020, Carlos Galindo (Outreach Coordinator) and Ryan Welch (Graduate Student involved in the Expedition process) met to discuss the current process. The conclusion of that meeting was that the current process is up to date and working smoothly.

1.3.b STEMobile: Maintain a dynamic process for scheduling the STEM Mobile.

Strategic Alignment: Strategic Goal 1: Tennessee Tech provides education that unleashes the potential and passion within our students and prepares them for successful careers and culturally enriched lives. TTU also provides educational opportunities, programs, credentials, and degrees to fuel the lifelong learning necessary for enduring achievement. Priority Action 1A: Incorporate multiple experiential learning opportunities in all undergraduate programs. Priority Action 1B: Create a Tech-unique general education curriculum to provide foundation for technologically adept, analytically capable, career ready graduates. Priority Action 1C: Increase student diversity. Strategic Goal 2: Tennessee Tech innovates in all we do, embracing and deploying our technological foundation in our education, research, service, and stewardship. Priority Action 2A: Every college will develop and implement technology infused programs. Priority Action 2B: Increase research, scholarly activities, and intellectual and creative contributions aligned with university, college, and departmental strategic priorities. Priority Action 2C: Implement specific strategies, structures, and resources to serve adult learners and offer online/hybrid delivery systems to increase accessibility, expand our reach, and enhance our impact and reputation. Strategic Goal 3: Tennessee Tech is committed to optimizing resources and continuously improving effectiveness, efficiency, and return on investment for students. Priority Action 3A: Improve efficiency and effectiveness of operational/administrative processes and procedures. Strategic Goal 4: Tennessee Tech fosters partnerships with government, business, and non-profit organizations to advance economic and workforce development, create and disseminate knowledge, serve the public good, and generate cultural

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Assessment Tool: No specific assessment tool required. Objective met upon the completion of at least one annual formal meeting to review all aspects of the existing process and improve upon it (if needed).

Status: Successful. On April 24, 2020, Carlos Galindo (Outreach Coordinator) and Jared Holme (IT Specialist in charge of STEMobile) met to discuss the current process. During that meeting they decided to update the existing process. As a result, they developed a digital pre-survey/application that serves to expedite the STEMobile reservation process. A post survey was also created to collect feedback from the users about their experience with the STEMobile. Both the pre- and post-surveys were completed on June 7th, 2020. Due to COVID-19, the STEMobile has not been moved since the creation of the new process, but the new process will be implemented beginning with its next move.

1.3.c Ray Morris Hall Facility: Maintain a dynamic process for scheduling space within Ray Morris Hall.

Strategic Alignment: Strategic Goal 3: Tennessee Tech is committed to optimizing resources and continuously improving effectiveness, efficiency, and return on investment for students. Priority Action 3A: Improve efficiency and effectiveness of operational/administrative processes and procedures.

Grand Challenge Anticipated Outcomes: Outcome 9: Attract new and encourage current stakeholders to engage in interdisciplinary opportunities that align with our mission and goals to achieve various aspects of the Grand Challenge. Outcome

10: Increase Tennessee Tech's relevance and establish our leadership and relevance to the community and every beneficiary by providing additional learning opportunities to the Upper Cumberland region, such as job shadowing with local Tech alumni and by establishing a presence in our Upper Cumberland school systems.

Assessment Tool:No specific assessment tool required. Objective met upon the completion of at least one annual formal meeting to review all aspects of the existing process and improve upon it (if needed).

Status: Successful. On March 26, 2020, Ashley Pompell (Administrative Associate in charge of Ray Morris Hall scheduling) and Darek Potter (Director) met to discuss the current process. The conclusion of that meeting was that the current process is up to date and working smoothly. The current process is as follows: 1) reservation requests are made through EMS, 2) Ashley reviews all requests in EMS and then confirms or denies the request based upon space availability, 3) reservation requesters are then notified via email from Ashley with the associated confirmation or denial. If the request is denied, Ashley emails the requester and explains the space conflict and discusses alternate options; if the request is approved, Ashley sends an approval email that also includes the regulations and contact information regarding their rental.

Oakley STEM Center Goal 2: P-12 Support

Define Goal:

Oakley STEM Center Goal 2:

P-12 Support: Increase STEM Center support for P-12 teachers and students.

Intended Outcomes / Objectives:

Goal 2 Objectives:

2.1 Provide at least twelve professional developments (PDs) for P-12 STEM teachers that are based on local needs, aligned with state and national standards, and that model best practices in research-based STEM education.

Strategic Alignment:Strategic Goal 1: Tennessee Tech provides education that unleashes the potential and passion within our students and prepares them for successful careers and culturally enriched lives. TTU also provides educational opportunities, programs, credentials, and degrees to fuel the lifelong learning necessary for enduring achievement. Priority Action 1B: Create a Tech-unique general education curriculum to provide foundation for technologically adept, analytically capable, career ready graduates. Priority Action 1E: Develop innovative, stackable credentials, and associated pathways

responsive to stakeholder needs and entrepreneurial opportunities. Strategic Goal 2: Tennessee Tech innovates in all we do, embracing and deploying our technological foundation in our education, research, service, and stewardship. Priority Action 2A: Every college will develop and implement technology infused programs. Priority Action 2B: Increase research, scholarly activities, and intellectual and creative contributions aligned with university, college, and departmental strategic priorities. Priority Action 2C: Implement specific strategies, structures, and resources to serve adult learners and offer online/hybrid delivery systems to increase accessibility, expand our reach, and enhance our impact and reputation. Strategic Goal 4: Tennessee Tech fosters partnerships with government, business, and non-profit organizations to advance economic and workforce development, create and disseminate knowledge, serve the public good, and generate cultural impact. Priority Action 4A: Develop new strategically driven sustainable partnerships. Priority Action 4B: Modernize, adapt, and create academic programs, continuing education certificates, and training activities responsive to impactful engagement. Priority Action 4D: Increase alumni and friend engagement and impact.

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Assessment Tool: No specific assessment tool required. Objective met upon completion of twelve professional developments (PDs) for P–12 STEM teachers that are based on local needs, aligned with state and national standards, and that model best practice in research-based STEM education.

Status: Not Successful. During the 2019-2020 fiscal year, the STEM Center provided 11 PDs that were attended by 136 P-12 educators (see table below). It should be noted that this objective would have been successful if COVID-19 did not cause the regional quarantine.

Professional Development Event Name	Date	Total attendance
STEM in Motion	8/24/2019	15

TSIN Innovative Educator Workshop	11/4 & 11/5/2019	11
TN Science Standards PD	11/5/2019	10
Math PLC Teacher Workshop	12/2/2019	10
TN Science Standards PD	12/3/2019	10
TSIN Innovative Educator Workshop	1/23 & 1/24/2020	15
TN Science Standards PD	2/11/2020	11
Math PLC Teacher Workshop	2/13/2020	10
TN Science Standards PD	3/10/2020	15
TSIN Innovative Educator Workshop	3/11 - 3/12/2020	9
STEM in Motion Virtual Workshop	6/22 - 7/2/2020	20
	Total	136

2.2 Provide a minimum of 20 STEM enrichment events for P–12 students. The enrichment events could take the form of school expeditions (field trips to the STEM Center), offsite school programs, student camps, or family events.

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Assessment Tool: No specific assessment tool required. Objective met upon completion of 20 STEM enrichment events during the 2019–2020 fiscal year for P–12 students in collaboration with P–12 teachers.

Status: Successful. During the 2019-2020 fiscal year, the STEM Center collaborated on 38 STEM enrichment events that served 3,551 P-12 students (see table below).

Outreach Event Name	School Name	County	Date	
Expedition	YMCA Camp	Putnam	7/10/2019	
Expedition	Girls STEM (Roane State)	Scott	7/23/2019	
Expedition	Girls STEM (Roane State)	Scott	7/24/2019	
Expedition	Independence Program TNTech	Putnam	8/1/2019	
Expedition	Prescott Middle School	Putnam	8/15/2019	
Expedition	Prescott Middle School	Putnam	8/16/2019	
Expedition	Jere Whitson Elementary	Putnam	8/29/2019	
Safari Saturday	N/A	Several Counties	9/14/2019	
Family Weekend	N/A	Several Counties	9/14/2019	
Expedition	Clay County Middle	Clay	9/19/2019	
STEM 4 All	Several Counties	Putnam & White	9/24/2019	
Expedition	Sequoyah High School	Monroe	9/26/2019	
Expedition	Upperman Middle School	Putnam	10/3/2019	

Expedition	Gordonsville Elementary	Putnam	10/10/2019	
Expedition	CHS Early Childhood	Putnam	10/21/2019	
Fab Friday	N/A	Several Counties	10/25/2019	
Expedition	Parkview Elementary	Putnam	10/31/2019	
Safari Saturday	N/A	Several Counties	11/2/2019	
Expedition	Martin Elementary	Cumberland	11/6/2019	
Expedition	PMA Conference	Several Counties	11/7/2019	
Expedition	Scout Troop 100	Putnam	11/12/2019	
Expedition	Rickman Elementary	Overton	11/14/2019	
Fab Friday	N/A	Several Counties	11/15/2019	
Expedition	Cameron Middle School	Putnam	11/19/2019	
Expedition	Antioch Middle School	Metro Nashville	11/21/2019	
Expedition	Castle Heights/ Doyle Elementary	Lebanon SSD	12/5/2019	
Expedition	Castle Heights/ Doyle Elementary	Lebanon SSD	12/12/2019	
Expedition	TN Virtual Academy	Several Counties	12/13/2019	
Expedition	Cane Creek Elementary	Putnam	12/19/2019	
Expedition	Northeast Elementary Expedition	Putnam	1/23/2020	
Expedition	Prescott South Elementary	Putnam	1/30/2020	
Safari Saturday	N/A	Several Counties	2/1/2020	
Expedition	Bledsoe County Middle	Bledsoe	2/6/2020	
Expedition	Hillman Elementary	Overton	2/13/2020	
Expedition	Cookeville High School	Putnam	2/20/2020	
Fab Friday	N/A	Several Counties	2/21/2020	
Expedition	Antioch Middle School	Davidson	2/20/2020	
Science Olympiad	N/A	Several Counties	2/29/2020	
			TOTAL	

2.3 Increase Lending Library usage above usage in the 2018–2019 fiscal year.

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Assessment Tool: No specific assessment tool required. Objective met after lending more items to each of the Upper Cumberland Districts than shown in the table below, which represents the number of items leased to each Upper Cumberland District in the 2018–2019 school year.

Status: Successful. The Lending Library usage increase from 520 items in 2018-2019 to 624 items in 2019-2020, which represents an increase of approximately 20%. The Lending Library also experienced an increase in the number of counties served. In 2018-2019 the Lending Library served 7 counties and in 2019-2020 the Lending Library served 9 counties. (see tables below)

2018-2019 Lending Library Usage			
Bledsoe		Overton	1
Cannon		Pickett	

Clay		Putnam	193
Cumberland	63	Scott	
Dekalb	55	Smith	
Fentress		Van Buren	
Jackson	95	Warren	1
Macon		White	112
Total	520		

2019-2020 Lending Library Usage			
Bledsoe		Overton	
Cannon		Pickett	
Clay		Putnam	296
Cumberland	49	Scott	
Dekalb	28	Smith	21
Fentress		Van Buren	
Jackson	6	Warren	81
Macon		White	58
Wilson	65	Hamilton	20
Total	624		

2.4 Increase STEMobile usage above usage in the 2018–2019 fiscal year.

Strategic Alignment: Strategic Goal 1: Tennessee Tech provides education that unleashes the potential and passion within our students and prepares them for successful careers and culturally enriched lives. TTU also provides educational opportunities, programs, credentials, and degrees to fuel the lifelong learning necessary for enduring achievement. Priority Action 1A: Incorporate multiple experiential learning opportunities in all undergraduate programs. Priority Action 1B: Create a Tech-unique general education curriculum to provide foundation for technologically adept, analytically capable, career ready graduates. Priority Action 1C: Increase student diversity. Strategic Goal 2: Tennessee Tech innovates in all we do, embracing and deploying our technological foundation in our education, research, service, and stewardship. Priority Action 2A: Every college will develop and implement technology infused programs. Priority Action 2B: Increase research, scholarly activities, and intellectual and creative contributions aligned with university, college, and departmental strategic priorities. Priority Action 2C: Implement specific strategies, structures, and resources to serve adult learners and offer online/hybrid delivery systems to increase accessibility, expand our reach, and enhance our impact and reputation. Strategic Goal 4: Tennessee Tech fosters partnerships with government, business, and non-profit organizations to advance economic and workforce development, create and disseminate

knowledge, serve the public good, and generate cultural impact. Priority Action 4A: Develop new strategically driven sustainable partnerships. Priority Action 4D: Increase alumni and friend engagement and impact.

Grand Challenge Anticipated Outcomes: Outcome 2: Increase student engagement by offering them the opportunity to address real issues and inspiring them and their faculty mentors to solve regional problems to improve quality of life. Outcome 3: Increase student career readiness by opening up new career and learning opportunities, establishing new connections and expanding professional networks. Outcome 5: Support diversity by bringing multicultural and inclusive activities to local communities. Outcome 6: Integrate important new technology into Grand Challenge activities and appropriate classes. Outcome 7: Provide a focus for innovation and creative ideas by campus implementation of the Grand Challenge. Outcome 9: Attract new and encourage current stakeholders to engage in interdisciplinary opportunities that align with our mission and goals to achieve various aspects of the Grand Challenge. Outcome 10: Increase Tennessee Tech’s relevance and establish our leadership and relevance to the community and every beneficiary by providing additional learning opportunities to the Upper Cumberland region, such as job shadowing with local Tech alumni and by establishing a presence in our Upper Cumberland school systems. Outcome 11: Raise Tennessee Tech’s public profile and dramatically improve public sentiment, garnering press coverage, and other visible accolades.

Assessment Tool: No specific assessment tool required. Objective met after STEMobile visits more sites during the 2019–2020 fiscal year than it visited during the 2018–2019 fiscal year.

Status: Not Successful. During the 2019-2020 fiscal year the STEMobile visited 5 sites, which is less than the 9 sites it visited during the 2018-2019 fiscal year (see table below). It should be noted that this objective might have been successful if COVID-19 did not cause the regional quarantine.

Move Date	County	Region	Location	
9/17/2018	Cumberland	East	Cumberland County High School	9 Trips 18-90
10/26/2018	Maury	Middle	Columbia State Community College	
11/7/2018	Blount	East	Denso Event	
11/12/2018	Clay	Middle	Celina K-8 School	
12/3/2018	Warren	Middle	Warren County, Morrison Elementary	
2/27/2019	Hamblen	East	Walters State Expo Center Hamblen County	
3/25/2019	Hamblen	East	Hamblen County Schools - Morristown	
3/27/2019	Hamblen	East	Hamblen County Schools - White Pine	
4/23/2019	Putnam	Middle	Memorial Gym TTU	
8/23/2019	Putnam	Middle	Prescott South Middle School	5 Trips

9/18/2019	Clay	Middle	Clay County High School	19-20
9/20/2019	Cumberland	East	Cumberland County High School	
10/19/2019	Hamilton	East	Chattanooga Public Library	
2/21/2020	Putnam	Middle	Upperman Middle / Upperman High Schools	

2.5 Increase Regional Science and Engineering Fair student participation above the prior year student participation.

Strategic Alignment:Strategic Goal 1: Tennessee Tech provides education that unleashes the potential and passion within our students and prepares them for successful careers and culturally enriched lives. TTU also provides educational opportunities, programs, credentials, and degrees to fuel the lifelong learning necessary for enduring achievement. Priority Action 1C: Increase student diversity.Priority Action 1D: Develop and expand experiences that emphasize diversity and build global awareness, such as international travel, study abroad, and other high impact practices.Strategic Goal 2:Tennessee Tech innovates in all we do, embracing and deploying our technological foundation in our education, research, service, and stewardship. Priority Action 2A: Every college will develop and implement technologically infused programs.Priority Action 2B: Increase research, scholarly activities, and intellectual and creative contributions aligned with university, college, and departmental strategic priorities.Strategic Goal 3: Tennessee Tech is committed to optimizing resources and continuously improving effectiveness, efficiency, and return on investment for students.Priority Action 3A: Improve efficiency and effectiveness of operational/administrative processes and procedures. Priority Action 3C: Continue to develop, implement, and evaluate a dynamic long-term budget model that informs effective financial management and consistent strategic investment. Strategic Goal 4: Tennessee Tech fosters partnerships with government, business, and non-profit organizations to advance economic and workforce development, create and disseminate knowledge, serve the public good, and generate cultural impact. Priority Action 4A: Develop new strategically driven sustainable partnerships.Priority Action 4C: Create and support a network of scholars to evaluate community engagement topics and opportunities. Priority Action 4D: Increase alumni and friend engagement and impact.

Grand Challenge Anticipated Outcomes:Outcome 1: Engage the entire campus community with a topic that can be grasped and envisioned by everyone on campus, with their own ideas for solutions incorporated into the endeavor. Outcome 2: Increase student engagement by offering them the opportunity to address real issues and inspiring them and their faculty mentors to solve regional problems to improve quality of life. Outcome 3: Increase student career readiness by opening up new career and learning opportunities, establishing new connections and expanding professional networks. Outcome 5: Support diversity by bringing multicultural and inclusive activities to local communities. Outcome 9: Attract new and encourage current stakeholders to engage in interdisciplinary opportunities that align with our mission and goals to achieve various aspects of the Grand Challenge. Outcome 10: Increase Tennessee Tech’s relevance and establish our leadership and relevance to the community and every beneficiary by

providing additional learning opportunities to the Upper Cumberland region, such as job shadowing with local Tech alumni and by establishing a presence in our Upper Cumberland school systems. Outcome 11: Raise Tennessee Tech's public profile and dramatically improve public sentiment, garnering press coverage, and other visible accolades.

Assessment Tool:No specific assessment tool required. Objective met after registering more projects for the 2020 Fair than were registered for the 2019 Fair. The 2019 Fair had 77 registered projects.

Status: Successful. The 2020 Science & Engineering Fair was cancelled one month prior to the event due to COVID-19. However, prior to its cancellation, there were 230 registered projects, which is a significant increase above the 105 registered projects in 2019 and the 5 registered projects in 2018.

Oakley STEM Center Goal 3: Tennessee Tech Support

Define Goal:

Oakley STEM Center Goal 3

Tennessee Tech Support: Increase STEM Center support for Tennessee Tech faculty, staff, and students.

Intended Outcomes / Objectives:

Goal 3 Objectives:

3.1 Increase Lending Library usage by Tennessee Tech faculty, staff, and students above usage in the 2018–2019 fiscal year.

Strategic Alignment:Strategic Goal 1: Tennessee Tech provides education that unleashes the potential and passion within our students and prepares them for successful careers and culturally enriched lives. TTU also provides educational opportunities, programs, credentials, and degrees to fuel the lifelong learning necessary for enduring achievement. Priority Action 1A: Incorporate multiple experiential learning opportunities in all undergraduate programs. Strategic Goal 2:Tennessee Tech innovates in all we do, embracing and deploying our technological foundation in our education, research, service, and stewardship. Priority Action 2A: Every college will develop and implement technology infused programs. Priority Action 2B: Increase research, scholarly activities, and intellectual and creative contributions aligned with university, college, and departmental strategic priorities.Priority Action 2C: Implement specific strategies, structures, and resources to serve adult learners and offer online/hybrid delivery systems to increase accessibility, expand our reach, and enhance our impact and

reputation. Strategic Goal 3: Tennessee Tech is committed to optimizing resources and continuously improving effectiveness, efficiency, and return on investment for students. Priority Action 3C: Continue to develop, implement, and evaluate a dynamic long-term budget model that informs effective financial management and consistent strategic investment. Strategic Goal 4: Tennessee Tech fosters partnerships with government, business, and non-profit organizations to advance economic and workforce development, create and disseminate knowledge, serve the public good, and generate cultural impact. Priority Action 4A: Develop new strategically driven sustainable partnerships. Priority Action 4D: Increase alumni and friend engagement and impact.

Grand Challenge Anticipated Outcomes: Outcome 1: Engage the entire campus community with a topic that can be grasped and envisioned by everyone on campus, with their own ideas for solutions incorporated into the endeavor. Outcome 2: Increase student engagement by offering them the opportunity to address real issues and inspiring them and their faculty mentors to solve regional problems to improve quality of life. Outcome 3: Increase student career readiness by opening up new career and learning opportunities, establishing new connections and expanding professional networks. Outcome 6: Integrate important new technology into Grand Challenge activities and appropriate classes. Outcome 7: Provide a focus for innovation and creative ideas by campus implementation of the Grand Challenge. Outcome 9: Attract new and encourage current stakeholders to engage in interdisciplinary opportunities that align with our mission and goals to achieve various aspects of the Grand Challenge.

Assessment Tool: No specific assessment tool required. Objective met after more Lending Library items are checked out by Tennessee Tech faculty, staff, and students during the 2019-2020 fiscal year than were checked out by Tennessee Tech faculty, staff, and students during 2018–2019 fiscal year. There were 258 Lending Library checked out by Tennessee Tech faculty, staff, and students during the 2018–2019 fiscal year.

Status: Not Successful. During the 2019-2020 fiscal year there were 148 Lending Library items checked out by Tennessee Tech faculty, staff, and students, which is less than the 258 Lending Library that were checked out by Tennessee Tech faculty, staff, and students during the 2018–2019 fiscal year. It should be noted that this objective might have been successful if COVID-19 did not cause the regional quarantine.

3.2 Increase Virtual Theater usage by Tennessee Tech faculty, staff, and students above their usage during the 2018–2019 fiscal year.

Strategic Alignment: Strategic Goal 1: Tennessee Tech provides education that unleashes the potential and passion within our students and prepares them for successful careers and culturally enriched lives. TTU also provides educational opportunities, programs, credentials, and degrees to fuel the lifelong learning necessary for enduring achievement. Priority Action 1A: Incorporate multiple experiential learning opportunities in all undergraduate programs. Strategic Goal 2: Tennessee Tech innovates in all we do, embracing and deploying our technological foundation in our education, research, service, and stewardship. Priority Action 2A: Every college will develop and implement technology infused program. Strategic Goal 4: Tennessee Tech fosters partnerships with government, business, and non-profit organizations to advance economic and workforce development, create and disseminate knowledge, serve the public good, and generate

cultural impact. Priority Action 4A: Develop new strategically driven sustainable partnerships.

Grand Challenge Anticipated Outcomes: Outcome 1: Engage the entire campus community with a topic that can be grasped and envisioned by everyone on campus, with their own ideas for solutions incorporated into the endeavor. Outcome 2: Increase student engagement by offering them the opportunity to address real issues and inspiring them and their faculty mentors to solve regional problems to improve quality of life. Outcome 6: Integrate important new technology into Grand Challenge activities and appropriate classes. Outcome 7: Provide a focus for innovation and creative ideas by campus implementation of the Grand Challenge. Outcome 9: Attract new and encourage current stakeholders to engage in interdisciplinary opportunities that align with our mission and goals to achieve various aspects of the Grand Challenge.

Assessment Tool: No specific assessment tool required. Objective met after the Virtual Theater is used at least three times by Tennessee Tech faculty, staff, or students, which would exceed the two times it was used by Tennessee Tech faculty, staff, or student during the 2018–2019 fiscal year.

Status: Successful. Faculty from the college of Education used the Virtual Theater three separate times during the 2019-2020 fiscal year to present lessons about the use of technology in education (see table below).

Space	Event Name	Date	Time	Number of Attendees
Virtual Theater	FOED 2011	9/12/2019	1:00-3:00	30
Virtual Theater	FOED 2011	9/19/2019	1:00-3:00	30
Virtual Theater	FOED 2011	11/26/2019	1:00-3:00	30

3.3 Host at least two TTU Department developed STEM outreach events at the STEM Center.

Strategic Alignment: Strategic Goal 1: Tennessee Tech provides education that unleashes the potential and passion within our students and prepares them for successful careers and culturally enriched lives. TTU also provides educational opportunities, programs, credentials, and degrees to fuel the lifelong learning necessary for enduring achievement. Priority Action 1A: Incorporate multiple experiential learning opportunities in all undergraduate programs. Priority Action 1C: Increase student diversity. Strategic Goal 2: Tennessee Tech innovates in all we do, embracing and deploying our technological foundation in our education, research, service, and stewardship. Priority Action 2A: Every college will develop and implement technologically infused programs. Priority Action 2B: Increase research, scholarly activities, and intellectual and creative contributions aligned with university, college, and departmental strategic

priorities. Strategic Goal 4: Tennessee Tech fosters partnerships with government, business, and non-profit organizations to advance economic and workforce development, create and disseminate knowledge, serve the public good, and generate cultural impact. Priority Action 4A: Develop new strategically driven sustainable partnerships. Priority Action 4B: Modernize, adapt, and create academic programs, continuing education certificates, and training activities responsive to impactful engagement. Priority Action 4D: Increase alumni and friend engagement and impact.

Grand Challenge Anticipated Outcomes: Outcome 1: Engage the entire campus community with a topic that can be grasped and envisioned by everyone on campus, with their own ideas for solutions incorporated into the endeavor. Outcome 2: Increase student engagement by offering them the opportunity to address real issues and inspiring them and their faculty mentors to solve regional problems to improve quality of life. Outcome 3: Increase student career readiness by opening up new career and learning opportunities, establishing new connections and expanding professional networks. Outcome 5: Support diversity by bringing multicultural and inclusive activities to local communities. Outcome 6: Integrate important new technology into Grand Challenge activities and appropriate classes. Outcome 7: Provide a focus for innovation and creative ideas by campus implementation of the Grand Challenge. Outcome 9: Attract new and encourage current stakeholders to engage in interdisciplinary opportunities that align with our mission and goals to achieve various aspects of the Grand Challenge. Outcome 10: Increase Tennessee Tech's relevance and establish our leadership and relevance to the community and every beneficiary by providing additional learning opportunities to the Upper Cumberland region, such as job shadowing with local Tech alumni and by establishing a presence in our Upper Cumberland school systems. Outcome 11: Raise Tennessee Tech's public profile and dramatically improve public sentiment, garnering press coverage, and other visible accolades.

Assessment Tool: No specific assessment tool required. Objective met after completing at least two TTU Department developed STEM outreach events at the STEM Center.

Status: Successful.

- 1) Money Maker Space Safari Saturday: The Money Maker Space Safari Saturday was an event designed in collaboration with faculty from the College of Business at Tennessee Tech. The event was free and open to the public. During this event the participants (PK-3rd) learned about financial literacy, working to earn money, and saving money. The participants were then allowed to spend play money in a Money Makerspace to purchase door prizes. The event was successful with close to 200 participants and their families.
- 2) Dino-Might STEM Fab Friday: This Dinosaur-themed hands-on STEM event was designed in collaboration with the Department of Earth Sciences. During this event participants learned about fossils, volcanoes, and dinosaurs through hands on STEM activities that were staffed by faculty and students from the Earth Sciences Department. This event was successful with close to 250 participants and their families.

3.4 Encourage STEM education research collaboration across Tennessee Tech colleges and assist in developing at least three grant proposals for research-based, knowledge-generating activities.

Strategic Alignment: Strategic Goal 2: Tennessee Tech innovates in all we do, embracing and deploying our technological foundation in our education, research, service, and stewardship. Priority Action 2B: Increase research, scholarly activities, and intellectual and creative contributions aligned with university, college, and departmental strategic priorities. Priority Action 2C: Implement specific strategies, structures, and resources to serve adult learners and offer online/hybrid delivery systems to increase accessibility, expand our reach, and enhance our impact and reputation. Strategic Goal 4: Tennessee Tech fosters partnerships with government, business, and non-profit organizations to advance economic and workforce development, create and disseminate knowledge, serve the public good, and generate cultural impact. Priority Action 4A: Develop new strategically driven sustainable partnerships.

Grand Challenge Anticipated Outcomes: Outcome 1: Engage the entire campus community with a topic that can be grasped and envisioned by everyone on campus, with their own ideas for solutions incorporated into the endeavor. Outcome 2: Increase student engagement by offering them the opportunity to address real issues and inspiring them and their faculty mentors to solve regional problems to improve quality of life. Outcome 3: Increase student career readiness by opening up new career and learning opportunities, establishing new connections and expanding professional networks. Outcome 5: Support diversity by bringing multicultural and inclusive activities to local communities. Outcome 7: Provide a focus for innovation and creative ideas by campus implementation of the Grand Challenge. Outcome 11: Raise Tennessee Tech's public profile and dramatically improve public sentiment, garnering press coverage, and other visible accolades.

Assessment Tool: No specific assessment tool required. Objective met after submitting at least three STEM education grant proposals for research-based, knowledge-generating activities.

Status: Successful. During the 2019-2020 fiscal year, STEM Center staff served as PI or Co-PI on seven proposals (see below) and assisted on the submission of six additional proposals.

RISE: Ambassadors for Rural Innovation & STEM Education (ARISE). TBR: Student Engagement, Retention and Success Grant. PI: Darek Potter, Co-PIs: Julie Baker and Harry Ingle. (FUNDED: \$49,875)

STEM Impact Tech Scholars (SITS). PI: Ashley Akenson, Co-PIs: Andrea Arce-Trigatti, Carlos Galindo. (NOT FUNDED: \$49,954)

TNTech Science Olympiad Collegiate Scholars (SOCS). PI: Carlos Galindo; Co-PIs: Andrea Arce-Trigatti, Stephanie Jorgensen. (FUNDED: \$50,000).

C2E2: Cross-Cultural Exchanges in Education. U.S. Embassy and Consulate in Poland Grant Program. PI: Dorota Silber-Furman; Co-PI: Darek Potter. (PENDING: \$25,253)

Girls Rule & Lead: Creative Opportunities to Develop and Empower Rural Success (GRL CODERS). American Honda Foundation Grant. PI: Darek Potter; Co-PIs: Cory Gleasman, Cale Koester, Carlos Galindo. (PENDING: \$38,984)

STEM in Motion: Integrating Transportation Engineering into the High School Classroom. Southeastern Transportation, Research, Innovation, Development, and Education Center (STRIDE). STRIDE Partner K–12 Grant. PI: Vahid Motevalli; Co-PI: Darek Potter (FUNDED; \$22,231)

Innovative STEM Education. TSIN Hub Operations and Innovative Educator Workshops Grant. PI: Darek Potter; Co-PIs: Jennifer Meadows, Carlos Galindo. (FUNDED; \$29,678)

3.5 Increase grant funding administered through the Oakley STEM Center by at least 25% over the amount of grant funding administered through the Oakley STEM Center during the 2018–2019 fiscal year.

Strategic Alignment: Strategic Goal 2: Tennessee Tech innovates in all we do, embracing and deploying our technological foundation in our education, research, service, and stewardship. Priority Action 2A: Every college will develop and implement technology infused programs. Priority Action 2B: Increase research, scholarly activities, and intellectual and creative contributions aligned with university, college, and departmental strategic priorities. Priority Action 2C: Implement specific strategies, structures, and resources to serve adult learners and offer online/hybrid delivery systems to increase accessibility, expand our reach, and enhance our impact and reputation. Strategic Goal 4: Tennessee Tech fosters partnerships with government, business, and non-profit organizations to advance economic and workforce development, create and disseminate knowledge, serve the public good, and generate cultural impact. Priority Action 4A: Develop new strategically driven sustainable partnerships. Priority Action 4C: Create and support a network of scholars to evaluate community engagement topics and opportunities.

Grand Challenge Anticipated Outcomes: Outcome 1: Engage the entire campus community with a topic that can be grasped and envisioned by everyone on campus, with their own ideas for solutions incorporated into the endeavor. Outcome 2: Increase student engagement by offering them the opportunity to address real issues and inspiring them and their faculty mentors to solve regional problems to improve quality of life. Outcome 3: Increase student career readiness by opening up new career and learning opportunities, establishing new connections and expanding professional networks. Outcome 6: Integrate important new technology into Grand Challenge activities and appropriate classes. Outcome 7: Provide a focus for innovation and creative ideas by campus implementation of the Grand Challenge. Outcome 9: Attract new and encourage current stakeholders to engage in interdisciplinary opportunities that align with our mission and goals to achieve various aspects of the Grand Challenge. Outcome 10: Increase Tennessee Tech's

relevance and establish our leadership and relevance to the community and every beneficiary by providing additional learning opportunities to the Upper Cumberland region, such as job shadowing with local Tech alumni and by establishing a presence in our Upper Cumberland school systems. Outcome 11: Raise Tennessee Tech's public profile and dramatically improve public sentiment, garnering press coverage, and other visible accolades.

Assessment Tool:No specific assessment tool required. Objective met after activating at least \$122,272 during the 2019–2020 fiscal year. A total dollar amount of \$122,271 was activated during the 2018–2019 fiscal year.

Status:Successful. The STEM Center activated a total dollar amount of \$245,317 during the 2019-2020 fiscal year.

Oakley STEM Center Goal 4: Community Support

Define Goal:

Oakley STEM Center Goal 4:

Community Support: Build sustainable partnerships with community stakeholders.

Intended Outcomes / Objectives:

Goal 4 Objectives:

4.1 Coordinate at least six STEM education events (>100 participants per event) that are advertised directly to the community.

Strategic Alignment:Strategic Goal 1: Strategic Goal 1: Tennessee Tech provides education that unleashes the potential and passion within our students and prepares them for successful careers and culturally enriched lives. TTU also provides educational opportunities, programs, credentials, and degrees to fuel the lifelong learning necessary for enduring achievement. Priority Action 1C: Increase student diversity.Strategic Goal 2:Tennessee Tech innovates in all we do, embracing and deploying our technological foundation in our education, research, service, and stewardship. Priority Action 2A: Every college will develop and implement technologically infused programs.Strategic Goal 4: Tennessee Tech fosters partnerships with government, business, and non-profit organizations to advance economic and workforce development, create and disseminate knowledge, serve the public good, and generate cultural impact. Priority Action 4A: Develop new strategically driven sustainable partnerships. Priority Action 4B: Modernize, adapt, and create academic programs, continuing education certificates, and training activities responsive to impactful engagement.Priority Action 4D: Increase alumni and friend engagement and impact.

Grand Challenge Anticipated Outcomes: Outcome 2: Increase student engagement by offering them the opportunity to address real issues and inspiring them and their faculty mentors to solve regional problems to improve quality of life. Outcome 3: Increase student career readiness by opening up new career and learning opportunities, establishing new connections and expanding professional networks. Outcome 5: Support diversity by bringing multicultural and inclusive activities to local communities. Outcome 6: Integrate important new technology into Grand Challenge activities and appropriate classes. Outcome 7: Provide a focus for innovation and creative ideas by campus implementation of the Grand Challenge. Outcome 9: Attract new and encourage current stakeholders to engage in interdisciplinary opportunities that align with our mission and goals to achieve various aspects of the Grand Challenge. Outcome 10: Increase Tennessee Tech’s relevance and establish our leadership and relevance to the community and every beneficiary by providing additional learning opportunities to the Upper Cumberland region, such as job shadowing with local Tech alumni and by establishing a presence in our Upper Cumberland school systems. Outcome 11: Raise Tennessee Tech’s public profile and dramatically improve public sentiment, garnering press coverage, and other visible accolades.

Assessment Tool: No specific assessment tool required. Objective met after coordinating at least six STEM education events of more than 100 participants per event that were advertised directly to the community.

Status: Successful. During the 2019-2020 fiscal year, the STEM Center coordinated and hosted 9 onsite STEM education events that had a total attendance of over 100 people. After the arrival of COVID-19, the STEM Center developed a STEM AT HOME program that provided weekly STEM enrichment activities. The STEM AT HOME program conducted 14 weekly events during the 2019-2020 fiscal year and weekly attendance averaged well over 100 participants per week. (see tables below)

Outreach Event Name	Date	Total Kids	Total Attendance
Money Makerspace	9/14/2019	169	254
Family Weekend	9/14/2019	0	220
Spooky STEM Fab Friday	10/25/2019	180	320
Seussical STEM Safari Saturday	11/2/2019	156	242
Kitchen Kaboodle Fab Friday	11/15/2019	89	129
Winter Solstice Event	12/20/2019	78	110
Groundhog Day Safari Saturday	2/1/2020	130	210
Dino-Might STEM Fab Friday	2/21/2020	198	335
Science Olympiad	2/29/2020	233	250
Totals		1233	2070

Outreach Event Name	Date	Total Kids	Total attendance
STEM at Home Gems Be Gone	3/30/2020	150	150

STEM at Home Water Wonders	4/6/2020	150	150
STEM at Home Sensational Sound	4/12/2020	150	150
STEM at Home Earth Day	4/20/2020	150	150
STEM at Home Build it	4/27/2020	150	150
STEM at Home Rollin in the Dough	5/4/2020	150	150
STEM at Home Seed-Sational	5/11/2020	150	150
STEM at Home Breath of Fresh Air	5/18/2020	150	150
STEM at Home Out of this World	5/25/2020	156	156
STEM at Home Healthy Bodies	6/1/2020	153	153
STEM at Home Dino-Might STEM	6/8/2020	158	158
STEM at Home May the Force Be With You	6/15/2020	152	152
STEM at Home Seuss-Tastic STEM	6/22/2020	166	166
STEM at Home STEM Celebration	6/29/2020	179	179
Totals		2,164	2,164

4.2 Acquire industry funding for at least three STEM Center events.

Strategic Alignment: Strategic Goal 3: Tennessee Tech is committed to optimizing resources and continuously improving effectiveness, efficiency, and return on investment for students. Priority Action 3C: Continue to develop, implement, and evaluate a dynamic long-term budget model that informs effective financial management and consistent strategic investment. Strategic Goal 4: Tennessee Tech fosters partnerships with government, business, and non-profit organizations to advance economic and workforce development, create and disseminate knowledge, serve the public good, and generate cultural impact. Priority Action 4A: Develop new strategically driven sustainable partnerships. Priority Action 4D: Increase alumni and friend engagement and impact.

Grand Challenge Anticipated Outcomes: Outcome 9: Attract new and encourage current stakeholders to engage in interdisciplinary opportunities that align with our mission and goals to achieve various aspects of the Grand Challenge. Outcome 10: Increase Tennessee Tech's relevance and establish our leadership and relevance to the community and every beneficiary by providing additional learning opportunities to the Upper Cumberland region, such as job shadowing with local Tech alumni and by establishing a presence in our Upper Cumberland school systems. Outcome 11: Raise Tennessee Tech's public profile and dramatically improve public sentiment, garnering press coverage, and other visible accolades.

Assessment Tool: No specific assessment tool required. Objective met after securing industry funding for at least three STEM Center events.

Status: During the 2019-2020 fiscal year, the STEM Center received a combined \$11,500 in support from two industry partners as well as \$800 in private donations.